Does FIN 48 Benefit the Tax Authorities through an Increase in Taxpayer Compliance?

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Recent financial guidelines and regulations focus on the importance of increasing transparency in financial reporting of companies to protect investors. Financial Accounting Standards Board (FASB) Statement No. 109 (FASB 109), "Accounting Uncertainty in Income Taxes," and its interpretation by FASB, Financial Interpretation No. 48 (FIN 48), adopted in December 2006, is an example of one such regulation. Statements of Financial Accounting Standards (SFAS) 109, "Accounting for Income Taxes," released in 1992, provide the principle of deriving tax costs in financial statements. FASB 109 and FIN 48 complement SFAS 109 and provide guidelines on calculating tax costs under uncertain tax positions. Companies are often uncertain about the tax authorities' acceptance of their tax calculations. These guidelines assist in reporting the expected acceptance of controversial tax positions by tax authorities.

Prior to FIN 48, the public was concerned with companies' possible underestimation of their taxes, specifically when companies are uncertain whether the tax authorities accept their tax positions.[1] Since a positive probability exists that an uncertain tax position goes unexamined, companies have incentives to use aggressive tax planning to minimize taxes. Given a tax examination, the IRS negotiates with the taxpayer using various formal and informal processes to correct the current taxes. Even if the company's uncertain tax position is corrected through the process, the company generally pays at most the difference in the tax calculation, interest, and possibly penalties. Most of this should have been initially paid by the company. This is especially true for U.S. Federal taxes, as most taxpayers are generally not audited and only subject to the "tax audit lottery."[2]

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[1] For example, Poterba et al. (2007) investigate the deferred tax positions of large U.S companies during 1993, essentially the first year of implementation of SFAS109, and 2004. Using panel data on deferred tax assets (DTAs) and deferred tax liabilities (DTLs) of 100 FORTUNE 50 companies, they find that a higher proportion of companies have a net DTL rather than a DTA. Their analysis also shows that the aggregate value of deferred tax liabilities is larger than that of deferred tax assets in the U.S. corporate sector.

[2] Only 0.8 percent for companies with assets less than $250 thousand were subject to IRS examinations in Fiscal year 2007 (IRS, 2008).

Financial statements may not reflect the actual financial situation of a company. Plesko (2007) finds that some companies report significant financial statement income without tax consequences and use tax planning without being subject to financial reporting costs. Given the incentives to use aggressive tax planning, companies need to allocate money to a tax reserve for tax contingencies.[3] A tax reserve is essentially equal to the company's expectation of additional tax expenses after the finalization of a tax audit. Increases in tax reserves reduce current assets and/or income. Blouin and Tuna (2007) show that companies used tax reserves as "earnings smoothing" tools prior to FIN 48. Companies increased their tax reserves when business was booming to reduce expectations on the company's stock and reduced tax reserves when business was depressed to increase earnings. In addition, companies disclosed nonrecurring income components strategically to highlight good news. In order to avoid misleading investors, FIN 48 was implemented to require companies to standardize their tax-related disclosures to increase the accuracy of company financial statements.

Policymakers are interested in the effects of adopting FIN 48 as it may affect tax revenues. Some researchers believe that FIN 48 will increase companies' taxes.[4] Under FIN 48, companies cannot record a tax benefit of an uncertain tax position if the probability of successfully defending the tax position against a tax authority is not "more-likely-than-not" or not above 50.0 percent. Among tax practitioners, this threshold is considered to be higher than the one used previously. Additionally, FIN 48 requires companies to publicly disclose additional information regarding their tax positions. Tax authorities gain access to more detailed information regarding tax positions of companies with the implementation of FIN 48. This additional information reduces the possible asymmetry in information between the company and the tax authority and reduces the tax authorities' costs in selecting companies for tax audits. While the literature discusses FIN 48's effects on financial reporting strategies, its effect on tax revenues is not yet understood and explored.[5]

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[3] Tax contingencies are reserves for uncertain tax positions. Tax contingencies are also known as tax cushion, tax exposures, reserve for uncertain tax positions, and contingent reserves, etc. While there are other types of tax reserves, including reserves for current taxes and reserves for deferred taxes, for the purposes of this paper, we use the term tax reserves, specifically, for reserves for tax contingencies.

[4] Readers are referred to Blouin et al. (2007) for the argument.

[5] The literature analyzes the effect of FIN 48 on tax reserves. Blouin et al. (2007) find that tax reserve reductions were more common for large companies but not small companies during 2005 through the first quarter of 2007. The authors infer that their findings support the necessity of FIN 48 as a conformity tool. Blouin et al. (2008) examine if companies with excess tax reserves were concerned with the increase in the probability of a tax audit after FIN 48. The authors hypothesized that this anticipation of FIN 48 may have altered companies' strategies regarding tax reserves prior to its implementation. Blouin et. al. (2008) show that companies with excess tax reserves tend to decrease their reserves prior to FIN 48 adoption, while other companies waited until adoption to increase tax reserves. The literature shows that the effects of FIN 48 on companies' strategies vary by specific company characteristics, such as company size and tax reserve levels.

We examine the effects of FIN 48 on tax revenues using the S&P Compustat North America database. The sample includes 78,061 observations on 9,465 U.S. companies from 1989 through 2008. Our analysis compares companies' taxes as reported on their financial statements before and after the implementation of FIN 48 with the use of a reduced-form empirical model. We also explore the possible differential effects by company size as companies of different sizes face different tax audit probabilities, and resources to defend tax positions, thus, may behave differently.

Our analysis shows that FIN 48 appears to have had a statistically significant effect on U.S. companies' taxes only in the year of implementation and not for the subsequent year. On average, U.S. companies increased their U.S. Federal taxes with their implementation of FIN 48. As a proportion of their U.S. Federal taxes, smaller companies increased their tax outlays by more than larger companies. A combination of the companies' differing access to resources for tax planning strategies, tax audit defense, and the tax audit lottery may explain this result. As the company size decreases, the resources available to implement and defend aggressive tax planning strategies generally fall as a proportion of tax savings. However, smaller companies generally have a less of a likelihood of being audited compared with larger companies. Very large multinational companies have sophisticated tax planning strategies to reduce their overall effective tax rates. Also, these companies have relatively more resources to defend their positions in tax examinations. However, these companies have a larger probability of being audited.

Prior to FIN 48, smaller companies may have depended more heavily on the tax audit lottery and the asymmetric information advantage. FIN 48 reduces the information advantage enjoyed by these smaller companies. Therefore, smaller companies may have been affected more than larger companies.

The remainder of the paper is organized as follows. It overviews FIN 48 and the data used for analysis. It describes an empirical model for studying the effect of FIN 48 on tax revenues. Results of the analysis are presented, and the paper concludes.

Effects of FIN 48 Disclosures

In July 2006, the FASB released Financial Interpretation No. 48 entitled "Accounting for Uncertainty in Income Taxes—An Interpretation of FASB Statement 109 FIN 48." As FASB 109 did not provide specific guidance on addressing tax uncertainties, FIN 48 provides companies with these methods and guidelines. Prior to FIN 48, there were minimal standards in accounting

for uncertain tax positions in the companies' financial statements. Companies adopted different practices which resulted in the use of inconsistent criteria to recognize, derecognize, and measure benefits related to income taxes. This affected the public's ability to compare the companies' reported tax assets and liabilities in their financial statements. FIN 48 was issued to standardize this process by reducing the companies' flexibility in accounting for uncertain tax positions.

FIN 48 increases disclosure, transparency, and comparability for tax authorities and investors. As such, these FIN 48 disclosures received much attention. The primary concern is its effect on tax audits since the tax authorities are monitoring these disclosures.[6] While tax examination teams are generally not allowed to request tax work papers, an IRS senior adviser on transfer pricing stated that examination teams may utilize the FIN 48 disclosures themselves in selecting issues to examine during the tax audit (Tax Management Transfer Pricing Report (TMTPR), November 6, 2008). Similarly, foreign tax authorities have also been interested in the FIN 48 disclosures. FIN 48 applied to all companies that use the U.S. Generally Accepted Accounting Principles (GAAP). This includes tax-exempt entities and foreign companies registered with the Securities and Exchange Commission (SEC). As FIN 48 affects multinational corporations preparing financial statements for the SEC in the U.S., it affects these companies' uncertain tax positions in all jurisdictions. Non-U.S. tax authorities can monitor these FIN 48 disclosures to increase their information set and minimize the use of tax audit resources.[7] Furthermore, policymakers, including those in the Senate, are also interested in the effect of FIN 48 to increase tax compliance.[8]

Our initial hypothesis is that introducing FIN 48 has increased taxes paid by companies. Adopting FIN 48 potentially reduces the information

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[6] The IRS Large and Mid-Size Business (LMSB) Division Deputy Commissioner of International stated on January 4, 2008, that the IRS is monitoring FIN 48 disclosures regarding transfer-pricing-related uncertainty discussions and tax reserves (Bureau of National Affairs (BNA), January 8, 2008). While the Deputy Commissioner stated that the IRS is closely observing these disclosures; the IRS has not changed its position on its policy of restraint for tax work papers. As of December 2008, the IRS maintains a policy of voluntary restraint regarding the request for calculations and documents in the work papers used to calculate tax accrual, including FIN 48 disclosures.

[7] An official at H.M. Revenue and Customs (HMRC), the U.K. tax authority, stated that HMRC have been monitoring the FIN 48 disclosures closely. Not only have HMRC been monitoring to obtain additional information for tax audit purposes, the office stated that HMRC have been monitoring the effects these disclosures have on share prices; the market reactions to such disclosures; and financial analysts' use of these disclosures (TMTPR, December 4, 2008).

[8] Senator Carl Levin and the Senate Homeland Security and Governmental Affairs Permanent Subcommittee on Investigations have requested the work paper files surrounding FIN 48 and international transactions including transfer pricing. It was stated that Senator Levin believed this policy of restraint is ill-conceived, and, during 2007, this committee requested work paper files for an undisclosed set of companies regarding advanced pricing agreements and the amounts of unrecognized tax benefits (TMTPR, September 11, 2008).

asymmetry faced by tax authorities. This may reduce the resources necessary for tax authorities to perform tax examinations. The tax authorities can raise the efficiency of selecting companies for tax audits and focus attention on specific tax issues within a tax audit. Nevertheless, different firms may react differently to FIN 48's introduction.[9] For example, firms of different sizes as measured by revenue and/or capital assets may react differently to FIN 48 implementation. These differential behavior responses may be due to a) the differing exposure to tax audits and b) differing levels of resources needed for creative tax planning and tax audit defense. The probability of being selected for a tax audit decreases with company size. Very large companies are continuously audited. As such, the financial and tax records of these companies are continuously scrutinized by the IRS. On the other hand, smaller companies are only exposed to the "tax audit lottery."[10] Similarly, larger companies generally have more resources to gain access to higher quality more sophisticated tax strategies and tax professionals with higher ability to construct, implement, and defend these strategies.

There is a tradeoff effect between these two factors—tax audit lottery and resources for tax saving. The effects of FIN 48 may vary depending on which factor is more dominant. One possible hypothesis is that larger companies with continuous tax audits are less likely to alter their behaviors with FIN 48 relative to their smaller counterparts. With continuous scrutiny and focus, the asymmetric information gap between large companies and the tax authorities may be smaller than the gap between smaller companies and the tax authorities. With FIN 48, all else held equal, we may observe smaller companies increasing their taxes, while larger companies are unaffected by FIN 48.

Another hypothesis is that introducing FIN 48 may increase taxes for large companies. Prior to FIN 48, companies did not have the same demands

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[9] One Ernst & Young director of Tax Accrual Services was not surprised with the diversity in FIN 48 disclosures. He remarked that, since the analysis depends on the facts and circumstances, as well as a company's intentions in ultimately resolving the tax position, the results may be inconsistent between companies. One auditor at a Big Four firm anonymously stated that companies showed various ranges of FIN 48 responses. While some companies reported having an uncertain tax position, the company deemed some positions as being immaterial for reporting purposes. Thus, the tax position was reported not to materially affect earnings or retained earnings (BNA May 22, 2007).

[10] The proportion of tax returns examined by the IRS by asset groups provides the evidence. Only 3.0 percent of the tax returns in each asset group with assets less than $10 million were examined in FY 2007. This probability increases dramatically once assets surpassed $10 million (18.5 percent of the tax returns in the 5 asset categories between $10 million and $1.0 billion were examined) and approximately doubles to 31.6 percent for companies with assets between $1.0 billion and $5.0 billion. The probability further doubled to 62.9 percent for companies with assets between $5.0 billion and $20.0 billion. All tax returns for companies with assets above $20.0 billion were audited.

on disclosing the viability of their tax positions. Larger companies have more complex business structures with affiliates in many countries. These companies may have used their multinational structures to implement complex aggressive tax positions prior to FIN 48. Some aggressive tax positions may not pass the "more-likely-than-not" threshold of FIN 48. Under this hypothesis, larger companies would be more likely to increase their taxes with FIN 48. These larger companies may reduce the number of aggressive tax positions, especially those that do not pass the "more-likely-than-not" threshold.

The following section examines which hypothesis seems to explain what happened after the introduction of FIN 48. Of course, our analysis accounts for a third possibility: FIN 48 did not affect companies' taxes at all.

Data

The majority of the data we used were extracted from the S&P Compustat North America database DVD issued in April 2009. The Compustat DVD contains financial and market data for approximately 21,000 public companies, including financial information on approximately 10,000 currently active companies and approximately 10,900 inactive companies. The information includes income variables (pretax income, sales revenue); tax cost variables (Federal taxes); cost variables (cost of goods sold (COGS); sales, general, and administrative expenses (SG&A); R&D expenditures); asset and debt variables (cash and cash equivalents, gross amounts of property, plant, and equipment (PP&E), inventory levels, goodwill, debt, and capital); and the country of incorporation. Each Compustat DVD provides a panel dataset of up to 20 years generally on publicly owned companies obtained from the documents filed with the Securities and Exchange Commission (SEC). We used the full panel available in our Compustat DVD; therefore, the time period for our analysis is 1989 through 2008. This time period includes two recessions in the U.S. economy and, thus, is relevant to analyze companies' strategic behaviors under several alternative situations.

We obtained data on the producer price index (PPI) for all commodities. All monetary measures are deflated with the PPI to 2007 dollars and are measured in millions of dollars. We used the PPI because companies' business environments may be more affected by changes in the PPI than the consumer price index.

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[11] These are companies in the agriculture, forestry, and fishing industry.

Our analysis focuses on U.S. companies in relevant industry sectors. We eliminated observations in Division A of the SIC Division Structure.[11] We also eliminated observations in the government sector which are observations in Division J and in the SIC of 43.[12] We expect companies in these SIC categories were not sensitive to the introduction of FIN 48. Our sample also excludes observations that were considered subsidiaries by Compustat or observations of companies that underwent a buyout. Subsidiaries are under the control of parents. Their responses could be captured by analyzing their parents' behaviors. Additionally, we eliminated any company with less than 3.0 years of observations. Unobserved company specific factors may bias our results. A sufficient number of observations for each company are necessary to control for such factors.

We split the observations into size categories in order to examine the possible differential effect of FIN 48 by company size. All companies with total assets greater than $250 million were classified as "Large." Nonlarge companies are those not classified as Large. This classification is consistent with the IRS Data Books.[13]

Table 1 shows summary statistics of our sample.

Table 1. Summary Statistics for U.S. Companies

	All		Large Companies		Nonlarge Companies	
Dependent Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
U.S. Federal Income Tax Payments	20.59	127.01	65.18	224.16	1.14	2.86
Variables of Interest	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Large Companies	30.37%		100.00%		0.00%	
Nonlarge Companies	69.63%		0.00%		100.00%	
FIN 48	4.64%		9.17%		2.67%	
FIN 48*Large	2.79%		9.17%		0.00%	
FIN 48*(Nonlarge)	1.86%		0.00%		2.67%	
FIN 48 (Year of Implementation)	3.51%		5.96%		2.45%	
FIN 48 (Year of Implementation)*Large	1.81%		5.96%		0.00%	
FIN 48 (Year of Implementation)*(Nonlarge)	1.70%		0.00%		2.45%	
Control Variables	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Net Sales Revenue	1,079.54	6,541.60	3,404.07	11,537.79	65.67	110.11
Total Cost	943.37	5,775.21	2,961.32	10,195.72	63.23	104.49
R&D Expense	22.17	202.97	66.98	364.19	2.63	7.63
Depreciation and Amortization	46.98	330.18	148.80	586.55	2.57	4.64
Interest Expense	40.93	659.03	131.96	1,190.90	1.22	2.74
Gross PP&E	577.03	4,295.44	1,844.30	7,644.90	24.30	43.95
Cash Holdings	196.49	3,153.58	622.78	5,699.60	10.56	20.18
Inventory	196.54	4,265.79	631.06	7,723.21	7.02	15.37
Goodwill	73.26	832.24	238.94	1,497.06	1.00	6.09
BV of Capital	1,910.00	14,737.25	6,066.15	26,272.57	97.26	212.13
BV of Debt	601.81	10,300.49	1,955.54	18,620.87	11.37	24.77
Number of Observations	78,061		23,707		54,354	

Note: All information except for ratios is presented in millions of 2007 U.S. dollars. All data are extracted from the Compustat Database. Total Cost is the sum of COGS, SG&A, and Depreciation and Amortization expenses.

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[12] Division J includes Public Administration industry. Entities with SIC codes between 4300 and 4399 are classified as United States Postal Service entities.

[13] The IRS Data Book provides the information on the proportion of audits by companies' size. The data for the years 1999 to 2006 show similar trends. Companies with less than $10 million in total assets generally experienced less than 10 percent audit rates. Companies with assets between $10 million and $250 million generally faced a 15 percent audit rate. Companies with assets greater than $250 million had an historic audit rate of approximately 30 percent.

We have 78,061 observations; 23,707 observations are Large compa- nies while the remaining 54,354 observations are not. Large companies ac- counted for 30.37 percent of the total sample. Approximately 4.64 percent of the observations are after FIN 48, and approximately 2.79 percentage points of these are classified as Large.

We also provide the percentage of observations that experienced FIN 48 for the first time. These are observations of companies with a fiscal-year end date between December 31, 2007, and November 30, 2008.[14] Approxi- mately 3.51 percent of the observations are from this period. Approximately 1.81 percentage points of these are classified as Large, and 1.70 are Non- large.

The table shows a significant difference in taxes between the Large companies and Nonlarge companies. While the average Federal taxes were approximately $20.6 million, the average Large company paid approximate- ly $65.2 million in Federal income taxes. The average Nonlarge company paid $1.1 million.

We also observe a significant difference in the other variables between Large and Nonlarge companies. In our sample, the average sales revenues were approximately $1.0 billion. Larger companies' sales revenues are 52 times larger than their smaller counterparts, which maintained approximately $65.7 million. The total costs of the average company were approximately $943.4 million. The average company earned an operating profit margin of 12.6 percent.[15] Larger companies' average total costs were approximately $3.0 billion, resulting in an operating profit margin of 13.0 percent, which is slightly larger than the average for all companies combined. Nonlarge companies earned an operating profit margin of approximately 3.7 percent. Nonlarge companies maintained more R&D expenditures and depreciation expenses relative to their book value of capital and maintained higher gross PP&E and cash relative to the book value of their capital assets than Large companies. These may imply that larger companies enjoy economies of scale. On the other hand, Large companies have a higher debt-to-capital ratio relative to Nonlarge companies.

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[14] Technically, observations with fiscal year end between December 16, 2007 and December 15, 2008 would have first implemenated FIN 48. Nevertheless, companies generally do not have fiscal-year end dates in the middle of the year. Therefore, our construction of this variable as between December 31, 2007, and November 30, 2008, will introduce minimal noise.

[15] Operating profit margin is (sales-total costs)/sales. It is a measure of the profitability of the operations relative to sales revenues.

In Table 2, we compared companies' taxes before and after FIN 48 to obtain a sense of the possible effect of FIN 48.

Table 2. Summary Statistics for Companies Before and After FIN 48

Dependent Variables	Before FIN 48			After FIN 48		
	All	Large	Nonlarge	All	Large	Nonlarge
U.S. Federal Income Tax Payments	18.30	60.49	1.14	67.47	111.62	1.21
Number of Observations	74,437	21,532	52,905	3,624	2,175	1,449
	Right Before FIN 48			**Right After FIN 48**		
Dependent Variables	All	Large	Nonlarge	All	Large	Nonlarge
U.S. Federal Income Tax Payments	48.47	99.84	1.09	54.96	105.58	1.11
Number of Observations	3,479	1,669	1,810	2,743	1,414	1,329

Note: U.S. Federal Income Tax Payments presented in millions of 2007 U.S. Dollars. All data are extracted from the Compustat Database.

The upper panel compares taxes before and after FIN 48. While the Federal taxes increased after FIN 48 for all samples, reviewing the level of taxes shows an upward trend, except for recession years when the level of taxes dropped. In the lower panel, we further compare taxes for the fiscal-year prior to the mandatory adoption of FIN 48 (the right before FIN 48 columns) and the fiscal year FIN 48 was instituted (the right after FIN 48 columns). In reviewing the lower panel, the average company increased taxes from $48.5 million to $55.0 million. In addition, large companies increased their federal U.S. taxes by $5.7 million and Nonlarge companies slightly increased taxes by approximately $200,000.

One inference from the analysis is that, on average, FIN 48 increased Federal income taxes. Nevertheless, these results should be interpreted cautiously because other factors that affect these variables have not been controlled for. Our model in the following section controls for other influencing factors through the use of a multivariate regression in order to examine the separate effects of FIN 48.

Model

Our analysis investigates the effects of the initial adoption of FIN 48 on the companies' taxes using the following reduced form model.

$$y_{ijt} = \alpha + \beta_1 * FIN48_{ijt} + ControlVariables_{ijt} * B + \gamma_{jt} = \delta_i + \tau_t + \varepsilon_{ijt.} \qquad (1)$$

The dependent variable y_{ijt} is company i's Federal income taxes in industry j in year t.

$FIN48_{ijt}$ is a dummy variable to distinguish companies' behaviors before and after FIN 48. We examined two different specifications of this

variable. In our first specification, $FIN48_{ijt} = FIN48^1_{ijt}$, it is equal to one if the company's observations are for FYE December 31, 2007, or later. Otherwise, $FIN48_{ijt}$ is equal to zero. We are also concerned that FIN 48 may have a transitional effect and affects companies' taxes only in the year of adoption. Therefore, we also constructed $FIN48_{ijt}$ as a dummy variable for a company's first experience with FIN 48. This variable, $FIN48_{ijt} = FIN48^2_{ijt}$, is equal to one for a company's observations with FYE December 31, 2007, to November 30, 2008. Otherwise, $FIN48_{ijt}$ is equal to zero.[16] β_1 is the coefficient of interest. For example, if the estimate is positive, companies are found to pay more tax after FIN 48.

ControlVariables$_{ijt}$ is a set of other variables that may affect our dependent variables. These variables are net sales revenues, total costs, R&D expenses, depreciation and amortization, interest expense, gross property plant and equipment (PP&E), cash and cash equivalents, inventory, goodwill, book value of capital, and book value of debt. In addition to these firm-specific variables, broader control variables were included to control for unobserved industry-specific effects, γ_{jt}.[17] We also included four-digit Standard Industrial Classification (SIC) group indicators. Unobservables that are specific to each year are controlled for with a set of time dummies, τ_t. We also included a linear time trend and total nonfarm employment to control for unobserved macroeconomic factors that are not captured by the industry dummies, and time dummies.[18]

The empirical model can be estimated by either a random effect model or a fixed effect model approach. Random effects are used if an individual company dummy, δ_i, is uncorrelated with the explanatory variable in all time periods. Otherwise, fixed effects are used to eliminate the unobserved company-specific effects, δ_i. As a cautionary measure, fixed effects, modeling may be more appropriate to control for any possible time-invariant company-specific unobservable factors that may affect taxes.

Since companies measured by size may have differing responses to FIN 48, we apply equation (1) to our subsample of Large and Nonlarge in

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[16] FIN 48 is effective for companies with fiscal years beginning after December 15, 2006. The fiscal year of many companies is the same as the calendar year, between January 1 and December 31. This implies that most companies adopted FIN 48 with their 2007 fiscal year. Some companies may have voluntarily adopted FIN 48 methodologies prior to finalizing their 2006 fiscal-year financial statements. However, given that many companies do not have a FYE in the middle of the month, our construction of the FIN48 variable should introduce minimal noise to the results.

[17] For most companies, γ_{jt} is time-invariant; however, a company can change its business to be reclassified into another SIC.

[18] Our analysis tried several macroeconomic variables, such as real GDP and unemployment rates. The inclusion of those variables did not have a qualitative effect on our results, and, thus, were dropped from our analysis.

addition to all observations. These analyses allow us the gain an understanding of the average response by size category.

Table 3. Regression Results for FIN 48

Variables	Overall	Large Sample	Nonlarge Sample
	1	2	3
FIN 48	4.07	9.08	0.07
	(3.07)	(8.50)	(0.11)
Sales	0.04	0.04	0.09
	(0.001)***	(0.001)***	(0.001)***
Total Cost	-0.04	-0.04	-0.08
	(0.001)***	(0.001)***	(0.001)***
R&D	-0.03	-0.04	0.01
	(0.002)***	(0.004)***	(0.002)***
Depreciation and Amortization	0.00	0.01	0.08
	(0.002)	(0.004)	(0.003)***
Interest Expense	-0.06	-0.06	-0.05
	(0.001)***	(0.002)***	(0.006)***
Gross PP&E	0.00	0.00	0.00
	(0.000)***	(0.000)***	(0.000)***
Cash and Cash Equivalents	0.00	0.00	0.02
	(0.000)***	(0.000)***	(0.001)***
Inventory	0.00	0.00	0.02
	(0.000)***	(0.000)	(0.001)***
Goodwill	0.01	0.01	-0.01
	(0.000)***	(0.001)***	(0.001)***
Book Value of Captial	0.01	0.01	0.00
	(0.000)***	(0.000)***	(0.000)***
Book Value of Debt	0.00	0.00	-0.01
	(0.000)***	(0.000)***	(0.001)***
Assumption on Company-Level Unobservables	FE	FE	FE
Number of Observations	78,061	23,707	54,354

Note: Our overall dataset has 9,465 companies and 78,061 observations. All columns provide the results of the fixed effect models. Column 1 provides the estimated results of FIN 48 on the entire population. Column 2 provides the estimated results of FIN 48's effects on large companies. Column 3 provides the estimated results of FIN 48's effects on nonlarge companies.

All models include company-specific variables. These variables are net sales revenues, total costs, R&D expenses, depreciation and amortization, interest expense, gross PP&E, cash and cash equivalents, inventory, goodwill, book value of capital, and book value of debt. We also include 4-digit SIC code indicators, time dummies, time trend, and nonfarm employment to control for other macroeconomic factors. Standard errors are provided in parentheses. All information is presented in millions of 2007 U.S. dollars. All company level data are extracted from the Compustat Database.
*** Indicates statistical significance at 1 percent.
** Indicates statistical significance at 5 percent.
* Indicates statistical significance at 10 percent.

Results of the Analysis

Table 3 provides the results of estimating (1) on U.S. Federal taxes using $FIN48_{ijt} = FIN48_{ijt}$.

Column 1 provides the overall effects of FIN 48 using the full sample. Column 2 presents the effects on the subsample of Large companies. Column 3 provides the effects on the subsample of nonlarge companies. While we estimate a positive coefficient on the effect of FIN 48, these coefficients are not statistically significant at conventional levels.

While the other covariates are included as controls, the estimated effects of company level covariates are provided. An increase in sales is correlated with increases in taxes, and increases in total costs reduce taxes owed to the U.S. Federal Government. We also find that increases in R&D expenditures are generally correlated with a reduction in taxes; however, the opposite relationship was uncovered with respect to Nonlarge companies. While we do not find a correlation between depreciation and amortization expenses and taxes for the overall sample and the sample of Large companies, we find that increases in such expenses increases taxes owed by Nonlarge companies. Generally, one should find that an increase in such expenses reduces taxes. We also find that increases in interest expenses are associated with reductions in taxes owed to the Federal Government, and increases in assets like Gross PP&E, Cash, Inventory, or Goodwill increase taxes owed to the Federal Government.

Table 4 provides the results of estimating (1) on U.S. Federal taxes using $FIN48_{ijt} = FIN48_{ijt}$.

Column 1 provides the overall effects of FIN 48 using the full sample. Column 2 presents the effects on the subsample of Large companies. Column 3 provides the effects on the subsample of Nonlarge companies. We also provide the estimated effects of the other company-level covariates.

Column 1 shows that U.S. taxes increased by $5.83 million with the implementation of FIN 48. Columns 2-3 show that the results differ by company size. While the average taxes of Large companies increased by $10.29 million, the average taxes of Nonlarge companies increased by $0.19 million.[19] It appears that the magnitudes of the estimates presented in Table 3 are qualitatively similar to those presented in Table 4. However, given statistical significance estimates presented in Table 4, it appears that FIN 48 may have had a transitional effect on taxes and not a sustained effect. The

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[19] We take care in interpreting the results. While our analysis controlled for many factors that affect taxes, if another event or policy jointly occurred at the end of December 2007, we would be unable to untangle its effects with those of FIN 48.

Table 4. Regression Results for FIN 48 in the Year of Implementation

Variables	Overall	Large Sample Only	Nonlarge Sample
	1	2	3
FIN 48	5.83	10.29	0.19
	(2.27)***	(5.86)*	(0.09)**
Sales	0.04	0.04	0.09
	(0.001)***	(0.001)***	(0.001)***
Total Cost	-0.04	-0.04	-0.08
	(0.001)***	(0.001)***	(0.001)***
R&D	-0.03	-0.04	0.01
	(0.002)***	(0.004)***	(0.002)***
Depreciation and Amortization	0.00	0.01	0.08
	(0.002)	(0.004)	(0.003)***
Interest Expense	-0.06	-0.06	-0.05
	(0.001)***	(0.002)***	(0.006)***
Gross PP&E	0.00	0.00	0.00
	(0.000)***	(0.000)***	(0.000)***
Cash and Cash Equivalents	0.00	0.00	0.02
	(0.000)***	(0.000)***	(0.001)***
Inventory	0.00	0.00	0.02
	(0.000)***	(0.000)	(0.001)***
Goodwill	0.01	0.01	-0.01
	(0.000)***	(0.001)***	(0.001)***
Book Value of Capital	0.01	0.01	0.00
	(0.000)***	(0.000)***	(0.000)***
Book Value of Debt	0.00	0.00	-0.01
	(0.000)***	(0.000)***	(0.001)***
Assumption on Company Level Unobservables	FE	FE	FE
Number of Observations	78,061	23,707	54,354

Note: Our overall dataset has 9,465 companies and 78,061 observations. All columns provide the results of the fixed effect models of the effect of FIN 48 for the first year of implementation. Column 1 provides the estimated results of FIN 48 on the entire population. Column 2 provides the estimated results of FIN 48's effects on large companies. Column 3 provides the estimated results of FIN 48's effects on nonlarge companies.

All models include company-specific variables. These variables are net sales revenues, total costs, R&D expenses, depreciation and amortization, interest expense, gross PP&E, cash and cash equivalents, inventory, goodwill, book value of capital, and book value of debt. We also include 4-digit SIC code indicators, time dummies, time trend, and nonfarm employment to control for other macroeconomic factors. Standard errors are provided in parentheses. All information is presented in millions of 2007 U.S. dollars. All company-level data are extracted from the Compustat Database.

*** indicates statistical significance at 1 percent.
** Indicates statistical significance at 5 percent.
* Indicates statistical significance at 10 percent.

estimated effects of the other company-level covariates remain generally the same as those provided in Table 3.

To understand the magnitude of these estimated effects, we divide the coefficient estimates by the U.S. Federal taxes for the year of implementation. Our results are presented in Table 5.

Table 5. Fraction of U.S. Federal Taxes Estimated To Be Due to FIN 48

Variables	Overall	Large Sample	Nonlarge Sample
	1	2	3
Estimated FIN 48 Effect/U.S. Federal Taxes during FIN 48 Implementation	10.6%	9.7%	17.4%
Number of Observations			

Note: Our overall dataset has 9,465 companies and 78,061 observations. Estimated effect from the fixed effects models are used. All columns provide the percentage of U.S. Federal tax payment due to FIN 48 in the year of implementation. Columns 1 provides the result for the entire population. Columns 2 provides the results for large companies. Columns 3 provides the results for nonlarge companies.

For the overall population, we find that approximately 10.6 percent of the taxes for the year of implementation may be due to adopting FIN 48. For Large companies, this percentage falls slightly to 9.7 percent. In addition, 17.4 percent of Nonlarge companies' taxes appear to be from implementing FIN 48. It appears that Nonlarge companies paid a higher proportion of their taxes because of FIN 48 adoption.

One inference is that FIN 48's disclosure requirements may have reduced companies' use of aggressive tax-saving strategies. Prior to FIN 48, companies may have saved on taxes by aggressive tax strategies that would not have passed the "more-likely-than-not" threshold in FIN 48, knowing their asymmetric advantages over tax authorities. Companies have full knowledge of their operations, while the tax authorizes must generally rely on publicly available sources and the information provided by the companies. Furthermore, while larger companies may have access to more sophisticated tax strategies via highly qualified tax professionals who plan and implement tax-saving strategies, smaller companies enjoyed a lower probability of being audited. FIN 48 helped to alleviate the asymmetric information problem faced by the tax authorities. Even though FIN 48 disclosures are the company's own assessments, FIN 48 increases the tax authorities' information and reduces the tax authorities' auditing costs. Thus, FIN 48 appears to have increased the taxes of companies via improved tax compliance and disproportionately affected smaller companies more than larger companies.

Conclusion

This paper examines whether FIN 48 affected companies' tax strategies. It does so by estimating the effects of FIN 48 on U.S. Federal taxes. While several studies were performed to understand FIN 48's effects on companies' financial reporting, its effects on tax revenues had not previously been explored. Our analysis compared companies' taxes before and after FIN 48 using reduced form linear empirical models. Specifically, we focused our analysis on the behavioral responses of U.S. companies with different sizes, since FIN 48 may have induced different effects by company size.

We find that FIN 48 appeared to affect the taxes of companies only during the year of implementation. Overall, FIN 48 appears to have increased taxes for U.S. companies. Regardless of company size, adopting FIN 48 appears to have increased company taxes in the U.S. Nevertheless, it appears that smaller companies increased taxes relatively more than larger companies. The results indicate the possibility that FIN 48's disclosure requirements have reduced the information asymmetry enjoyed more by smaller companies with lower probability of tax audits.

The current study could be extended. Our analysis examines overall impacts of FIN 48 on taxes as reported in the financial statements. Nevertheless, the tax reserves are buried within the data on taxes (Hanlon, 2003). Further research should be performed to tease out the annual U.S. Federal tax payment from the tax reserves. Another possible extension is to decompose domestic taxes and foreign taxes and to study the impacts by tax jurisdiction. While such analysis requires detailed private data, uncovering these effects would increase the understanding of the tax authorities, specifically about income shifting across countries.

Another extension is to conduct a robustness check of the current model specification. Our analysis uses the implementation date of FIN 48 as the threshold of the FIN 48 indicator. However, companies may adopt FIN 48 earlier than the mandate. As previous years are open to audit, companies may have wanted to reduce aggressive tax planning strategies prior to the mandated adoption of FIN 48. Since reaction to the implementation of FIN 48 may have occurred prior to the mandated date, we are currently estimating models with a modified FIN 48 indicator to allow for early adoption.

Future research can also be extended to develop a dynamic framework to understand the effects of FIN 48 on the companies' effective marginal tax rates. In the U.S., tax losses are carried backward and forward for a limited number of years to offset taxable incomes that existed in the past or

will exist in the future. Therefore, companies' tax decisions are intertemporal. Models developed in several works, including Shevlin (1987), Shevlin (1990), Graham (1996a), and Graham (1996b), may provide useful tools to extend the analysis. All of these topics represent potentially interesting future lines for research.

Acknowledgements

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Appendix

We needed to process the raw data prior to performing our analysis. We first eliminated any observation with missing data in the included variables. Second, differences in fiscal years among companies needed to be aligned for our analysis. Different companies have different fiscal year ends (FYE) throughout the year. For example, while many companies maintain a December 31 FYE, some companies end on March 31, and other end on other dates throughout the year. We assumed all companies with a FYE six months before and six months after December 31 FYE were in that particular fiscal year. For example, observations with FYE between July 01, 2005, and June 30, 2006, are classified as 2005 data. Third, we adjusted stock variables in balance sheets. Compustat measures these variables at the FYE; however, the average amount through the fiscal year is more relevant for our analysis.

Therefore, we obtained an average measure of all balance sheet data using the previous year's observation.[20] Fourth, we converted all Last in First Out (LIFO) inventory using the LIFO reserves to First in First Out (FIFO) inventory.[21] The LIFO and FIFO methods are the two major methods for inventory accounting. We assumed all companies used either the LIFO or FIFO inventory accounting method. If a company reports a LIFO reserve, the company is assumed to use the LIFO method. For the ith company in year t, we converted all average LIFO inventory to the FIFO inventory value using equation: $Avg.INV_{i,t}^{FIFO} = Avg.INV_{i,t}^{LIFO} + Avg.LIFO\ Reserve_{i,t}$ where $Avg.INV_{i,t}^{FIFO}$ is the FIFO measure of inventory, $Avg.INV_{i,t}^{LIFO}$ is the dollar amount of inventory as measured using LIFO method, and $Avg.LIFO Reserve_{i,t}$ is the amount of reserves in year t. As COGS is calculated using changes in inventory, an adjustment to COGS is made with the change in LIFO reserves. This converted all inventory and COGS to the same Scomparable levels.

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[20] If the previous year's observation did not exist, we did not calculate the average but rather used the FYE observation.

[21] The LIFO reserves are the difference between the FIFO value of inventory and LIFO value. The LIFO reserves are a measure of the cumulative amount that a company's taxable income or financial statement pretax income has been reduced by using the LIFO method.